

Flash 3D Enhancements for Autonomous Precision Landing and Hazard Detection and Avoidance, Phase II

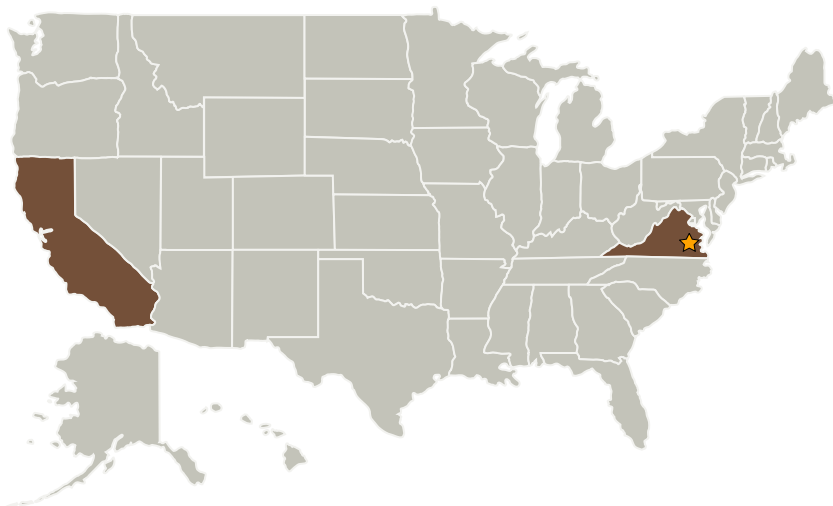
Completed Technology Project (2009 - 2010)



Project Introduction

With NASA's exploration initiative to return to Lunar Exploration and eventual human exploration of Mars, NASA has an increased need for advanced Autonomous Precision Landing and Hazard Detection and Avoidance solutions. Scanning LADAR and stereo video have significant shortcoming while ASC's Flash LADAR 3D video cameras can provide frames of 3D data in real time at video rates. The proposed high-sensitivity unit cell and ROIC enhances the sensitivity of ASC's standard ROIC by a very large factor as well as decreasing the associated unit cell area by a large factor. This enhancement reduces required laser power, reduces focal plane array power, allows PIN diode arrays to compete with APD detector arrays and increases the number of pixels possible in a given ROIC area. Advanced Scientific Concepts Inc. (ASC) is a small business that has developed a number of 3D flash LADAR systems. Flash Ladar Video Cameras (FLVC) are 3D vision systems that return range and intensity information for each pixel in real time. The ASC camera with its 128x128 3D array is the equivalent of 16000 range finders on one chip. This allows the sensor to act as a 3D video camera with functionality well beyond just range finding. Its small size, low power and fast range data frame rate (30Hz) provides an ideal Landing and Hazard Detection and Avoidance sensor

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Advanced Scientific Concepts, Inc.	Supporting Organization	Industry	Goleta, California

Primary U.S. Work Locations

California	Virginia
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Project Transitions

 **February 2009:** Project Start **October 2010:** Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX04 Robotic Systems
 - └ TX04.5 Autonomous Rendezvous and Docking
 - └ TX04.5.1 Relative Navigation Sensors